

Using Technology to Improve Wellness – Keri Jaworski, Brenda Woodward, Martha Roletto

Narrative Description of Current Classroom Technology Use

Currently we use several different types of technology in our classrooms. We have a set of portable wireless laptops, with a complete Office suite, a wireless printer, and power point projector. The mobile cart is shared between the science classrooms. We use the computers to perform simulated labs, research topics related to what we are studying, present research and lab projects on power point, and compile and analyze lab data. Our digital projector and two smart pads allow students to annotate their presentations as they give them. We are also able to give power point presentations as part of our lectures and include teacher annotations.

Our physical sciences classes have several different science specific pieces of technology, including a classroom set of radiation monitors and a set of Vernier probes. Among the things students study are comparative penetrating ability of three types of radiation, comparative shielding ability of different materials, and the effect of distance on exposure. More advanced classes extend this study to include graphical analysis of quantitative data from the radiation monitors and learn extrapolation skills. Less advanced classes use shielding data to determine the identity of an unknown radiation source.

In our math classes, students use TI calculators to graphically represent equations or to determine an equation for a set of data.

Narrative Description of Impact of Classroom Technology on Student Performance

It is difficult to summarize all of the ways that technology has impacted student performance in our classrooms. So we will give you a general statement and then two specific examples. In general, technology gives us alternative methods to teach the same information. If students hear something in class discussion and then are able to view it on a virtual tour or try it in a virtual lab, it increases their level of interest and provides an additional technique for delivery of the information.

Recently, ninth grade physical science students were given a list of potential energy sources for the human race and asked to select one from the list. Most students researched the selected energy source to find the positive and negative aspects of that form of energy. They focused on the positives, because they were later required to advocate for their energy source. The remaining students were assigned to the “energy commission” and researched only the negative aspects of all energy sources. Because our knowledge and understanding of energy changes constantly, this research would not have been possible without access to the Internet. Students accessed government and advocacy group sites for their information and communicated (via e-mail) with experts in the field. The students that selected one form of energy then presented what they had learned to the energy commission in the hopes of convincing the energy commission to select their form of energy as the best. Most of the presentations were given in Power Point. The students get into lively debates about the various forms of energy and the whole audience often ends up involved. Follow-up classroom discussions and a test indicate a much higher level of learning than classes given prior to introducing this project.

Our radiation detectors allow young, scientists to “see” radiation. Laboratory experiments teach students that radiation is everywhere, radiation can be useful, and exposure to radiation does not necessarily cause something to be radioactive. Students also learn that different forms of radiation behave differently. Students apply the principles learned while collecting laboratory data to identify unknown radioactive sources. They also graph experimental data and extrapolate this data to apply to real world situations. Radiation experiments are a favorite among many students.

Narrative Budget Description of Proposal for Classroom Purchases

The heart rate monitors will be used during aerobic activities in physical education class. Students will record their heart rates at specific time intervals. These monitors will be used to test the effects of aerobic activities in relation to resting heart rate. We are requesting 60 Polar A1/F1 basic heart rate monitors at the cost of \$39.00 each. In order to accommodate our 420 freshmen students, we are requesting two class sets (60) of heart rate monitors, for a total of \$2,340.00.

After gathering data from the heart rate monitors, the TI 84 Plus calculators will be used to display, graph and plot this data. Regression equations will be found using the TI84 Plus calculators and conclusions drawn. Many other statistical analyses will also be done. These calculators are the state of the art for this type of work. We are in need of one class set (32) of calculators, for a total of \$3,488.00. The grand total of our grant request is \$5,828.00.

Narrative Description of Enhanced Teaching through Implementation of Proposal

Purchasing heart rate monitors for our classrooms will enhance instruction by increasing understanding of cardiorespiratory endurance and the benefits of regular aerobic exercise. While wearing the heart rate monitors, students will be able to quickly and easily determine their heart beats per minute during periods of rest and exercise. According to the American College of Sports Medicine and Recreation, in order to reap optimal health benefits, an aerobic workout should be performed at an intensity of 55% - 90% of maximum heart rate (target training zone). A heart rate monitor would allow students to determine if they are working within their target-training zone.

It is no secret that our nation is suffering from diseases and conditions related to inactivity and obesity. It is estimated that 8.8 million children and adolescents aged 6-19 are overweight or obese (1). There is evidence that childhood/adolescent obesity predisposes people to heart disease later in life. In addition, an increased risk of high cholesterol, high blood pressure, insulin resistance and type II diabetes has been linked to obesity and inactivity (2). Increasing one's level of cardiorespiratory endurance (the ability of the cardiovascular and respiratory system to adapt to and recover from stress and physical activity) reduces the risk of developing heart disease and diseases related to obesity and inactivity (2). The best way to increase cardiorespiratory endurance is to perform moderate aerobic exercises while staying within the limits of one's target training zone.

Another exciting aspect of this project is the fact that it will be an interdisciplinary endeavor. At the beginning of the project students will formulate a hypothesis about the affects of aerobic exercise on their health. Students will then design a method for testing their hypotheses. They will collect the data produced by the heart monitors and other measurements of fitness in their physical education class and process, analyze, and graph the data in their math course using the TI calculators. The processed data will then return to the science classroom for further analysis of the data and experimental techniques and to the physical education classroom for discussions on the benefits of physical fitness.

By investing in heart rate monitors for our classrooms, we will be playing an active role in reducing the risks for cardiovascular disease and improving the overall quality of our student's lives. We will also be teaching to the whole student and showing them that learning is not something that can be compartmentalized or limited to just one classroom.

Work Cited:

1. American Heart Association News. 12/31/2002. "New Data on Obesity in Kids Sheds Light on a Growing Problem".
2. Wasik, Michael. "The Importance of Physical Activity". The City of Gainesville Official Website.

**Qwest Foundation for Education Grant Expenditure Plan
(Standard IFARMS Budget Format)**

Activity	100	200	300	400	500	TOTAL
	Salaries	Benefits	Contractual Agreements	Materials and Supplies	Capital Objects	
Heart Rate Monitors Polar A1/F1 Basic Heart Rate Monitor Graphing Calculators TI 84 Plus				60 @ \$39.00 (\$2,340.00) 32 @ \$109.00 (\$3,488.00)		
TOTAL				\$5,828.00		

